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in Pliocene time; that these creatures represent the type of hyena bear most nearly approaching the Arctotheres and were widely distributed in North America. There is reason to believe that from this group the Arctotheres may have developed within the American region, and that the Arctotheres by way of a wide land bridge came to people South America.

The present spectacle bears of South America seem then to represent the last remnant of a group which originated in the Old World, was once widely distributed over the world, and included the largest of all known bears.

AN UNIDENTIFIED BASE AMONG THE HYDROLYTIC PRODUCTS OF GELATIN

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Of the known amino acids yielded by acid hydrolysis of proteins the work of various authors¹ has indicated that four, viz., histidine, arginine, lysine, and cystine, are distinguished from the others by the relative insolubility of their phosphotungstates in acid solution. On the basis of this fact Van Slyke¹ devised a method for separating these four amino acids as phosphotungstates, and determining them by utilizing certain characteristics of their chemical structure. The non-amino nitrogen of this group of amino acids is entirely in the histidine and arginine. The arginine was determined directly, and the histidine was estimated on the assumption that all the remaining non-amino nitrogen was in histidine.

This assumption we have tested by comparing the histidine content of a number of proteins as determined in the above manner with the values determined by Koessler and Hanke's direct colorimetric method.² In casein, edestin, and fibrin, the results by the two methods agree. But in gelatin the calculation based on the non-amino nitrogen indicates 6.1 per cent of the total protein nitrogen in the form of histidine, while the colorimetric method shows only 1.8 per cent. There is evidently among the products of gelatin hydrolyzed by hydrochloric acid a substance, or substances, hitherto unrecognized, precipitated with phosphotungstic acid under the conditions ordinarily utilized to precipitate the hexone bases.

In attempting to isolate the substance we have precipitated it by means of phosphotungstic acid with the other bases, have redissolved the precipitate and freed it from phosphotungstic acid. The histidine and arginine were removed by precipitation with silver sulfate and barium hy-

dioxide, and the lysine as picrate. The residual solution contained an amount of non-amino nitrogen corresponding approximately to that determined by Van Slyke's method in excess of the arginine and histidine non-amino nitrogen.

Attempts to crystallize the free base or its derivatives have been successful only with the phosphotungstate. Recrystallization of the phosphotungstate yields a product in which the ratio, *Total N : Amino N* = 2 : 1. The free base prepd. from the recrystallized phosphotungstate is hygroscopic, and decomposes slowly when dried at 100°. It does not appear to be a peptide, for the ratio of amino to total nitrogen is not increased by boiling 40 hours with 20 per cent hydrochloric acid, nor by heating 8 hours in a bomb tube at 125° with 25 per cent sulfuric acid. We are engaged in the preparation of larger amounts of the substance in the hope of determining its structure.

¹ Literature quoted by D. D. Van Slyke, *J. Biol. Chem.*, 10, 1911 (15).

² Koessler, K. K., and Hanke, M. T., *J. Biol. Chem.*, 39, 1919 (497).

GENETICAL AND CYTOLOGICAL PROOF OF NON-DISJUNCTION
OF THE FOURTH CHROMOSOME OF DROSOPHILA
MELANOGASTER¹

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A mutant type of *D. melanogaster* known as "Diminished" gave genetical results which proved the involvement of a "deficiency,"² i.e., a multi-local loss of genes, in the chromosome corresponding to the "fourth linkage group"^{3,4} (see section I). Further exceptions to normal inheritance showed that non-disjunction⁵ of this chromosome had occurred giving rise to (Diminished) individuals lacking one member of the fourth-chromosome pair (see section II). The deficiency in this case consisted therefore in the loss of an entire chromosome. The haploid nature of Diminished was then proved cytologically: it was found that in the cells of Diminished individuals only one small round chromosome was present instead of a pair (section III). This finding demonstrates the correctness of the view that the carrier of the genes of the fourth linkage group is the small round chromosome. A positive direct proof is provided that a particular autosome is the carrier of the genes of particular non-sex-linked Mendelian characters.

I. The features that in the aggregate prove that a deficiency is involved are: